Department of the Environment, Transport and the Regions

GOOD PRACTICE GUIDE 202

Energy efficiency for food retailers

- Cut fuel bills by 20%
- Boost profits and be more competitive
- Benefits for large groups and single stores
- Help to combat global warming

GOOD PRACTICE GUIDE 202

HOW TO USE THIS GUIDE

This Guide is one of a series produced for retailers as part of the Department of the Environment, Transport and the Regions' (DETR) Energy Efficiency Best Practice programme. As well as targeting specific retail sectors, the series covers energy efficiency in building refurbishment and lighting. For details of other Guides see back page.

HOW TO USE THIS GUIDE

One of the few areas where retailers can make major cost savings with little investment or expertise – and without affecting customer service – is energy consumption.

By using energy more efficiently retailers can:

- cut fuel bills by 20% or more
- see their profits rise accordingly
- help to reduce emissions of carbon dioxide (CO_2), a major cause of global warming.

This Guide is for food retailers – everyone from local food stores to large supermarket groups. Designed for energy managers, store managers and owners or operators of individual stores, it covers the key areas where savings can be made and provides advice on appropriate energy-saving measures.

General energy efficiency advice for retailers can be found in Good Practice Guide 190, 'Energy efficiency action pack – for retail premises'. Topics covered in GPG 190 include: raising awareness of energy efficiency; training staff; setting targets and assessing performance; and carrying out energy inspections.

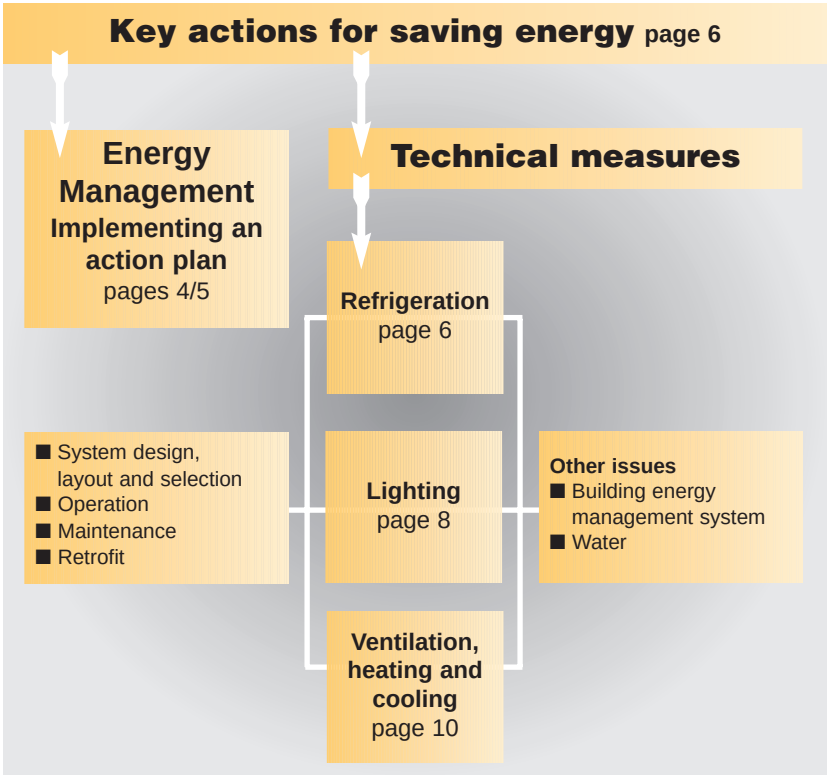
Achieving energy efficiency in retail outlets is a combination of:

- managing the energy used
- ensuring that energy-consuming equipment and systems are efficient.

The structure of this Guide reflects these two components. The energy management section outlines the steps in implementing an energy action plan. The technical section covers the principal areas of energy consumption within the store, with suggestions on how technical measures can improve energy-efficient operation of systems.

A 'route map' is shown, left, to help you find your way through the Guide, indicating where specific areas and issues are covered. Although you can adopt a 'pick-and-mix' approach, you may choose to use the route map to check for missing areas of potential energy savings.

The checklist opposite will also help you to assess the effectiveness of any agreed actions, once you have read the Guide and implemented the measures.



Case study

At Iceland Frozen Food, annual savings of £200 000 were obtained from a staff motivation campaign costing only £20 000. Further savings were obtained from reduced maintenance costs. Iceland's initiative was backed very visibly by senior management.

KEY ACTIONS

Key actions for saving energy

Refrigeration is generally the largest user of energy in food stores, followed by lighting, heating and hot water, and air-conditioning and ventilation.

Saving energy in these areas requires a number of energy management actions and technical measures.

Case study

Safeway chairman Sir Alistair Grant introduces the energy efficiency video 'Money to Burn', stressing that it is vitally important that Safeway controls its energy costs. The video has been distributed to stores with a comprehensive manual and training for a three-person energy team in each store.

Energy management actions

- Minimise air-conditioning requirements.
- Use computer software (eg spreadsheets or dedicated Building Energy Management System (BEMS) software) to monitor and control the energy used by refrigeration and services plant (eg monitoring and targeting).
- Ensure that display cabinets do not waste cooling, are correctly stocked and have night insulation blinds that are used regularly.

Technical measures

- Select the most appropriate refrigeration systems and specify high-efficiency compressors and controls.
- Choose efficient boiler and air-conditioning plant.
- Use heat rejected from central refrigeration for water heating or to heat the store.
- Ensure that lighting in sales areas uses energy-efficient lamps and fittings, and that lighting levels are not excessive and are reduced outside trading hours.

EFFICIENCY CHECKLIST

If you are taking energy efficiency seriously, your answer to most of the questions below should be 'yes'! Review the checklist again when you have read this Guide and taken any necessary action.

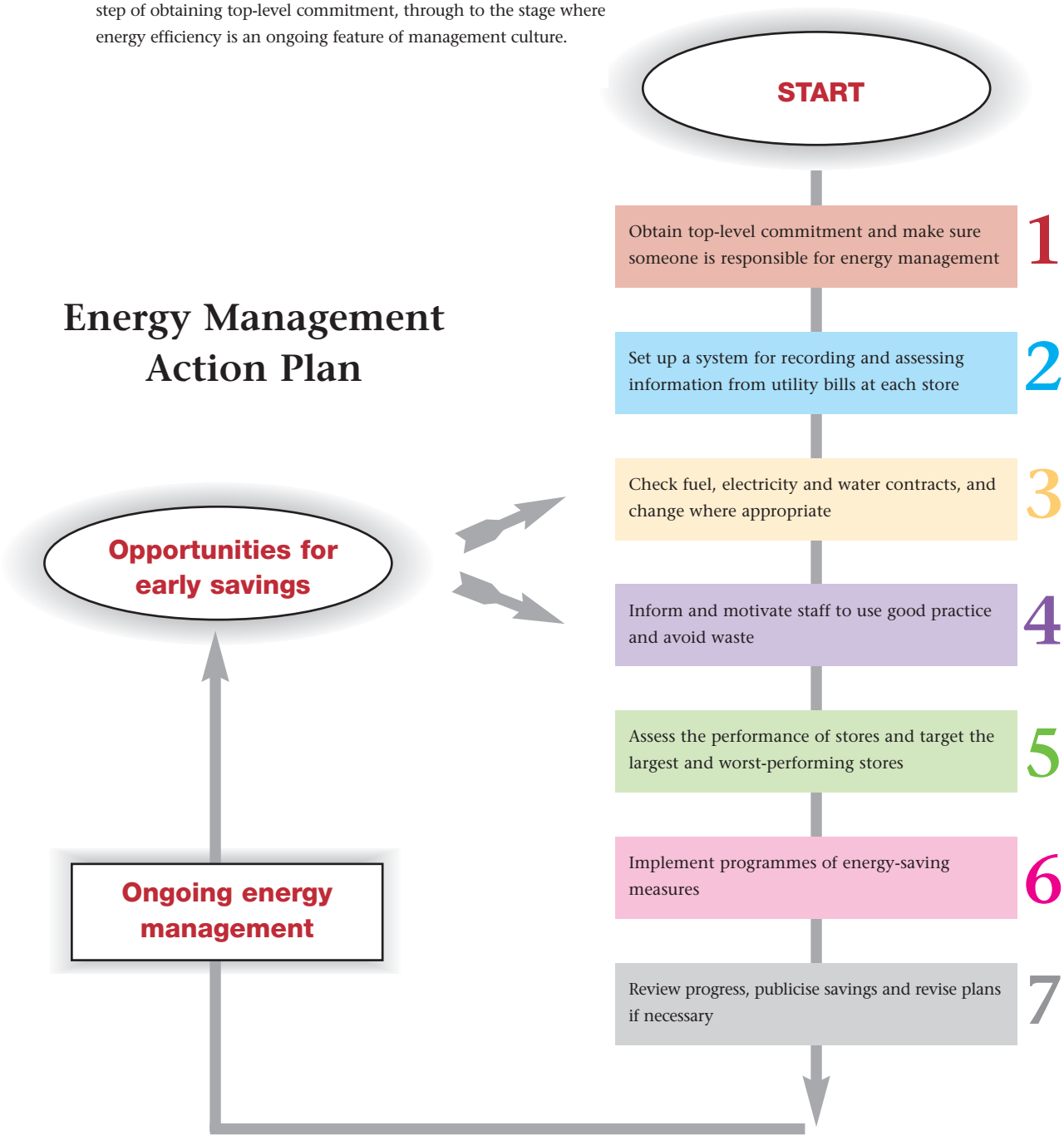
Management	**Yes**	**No**
Do you have a board member responsible for energy matters?	☐	☐
Is there someone in each store responsible for energy matters?	☐	☐
Do you know if your stores use less energy than food stores in other competitor groups? (See Good Practice Guide 190.)	☐	☐
Do you know the cost savings made by the group from any existing or past energy efficiency activity?	☐	☐
Do you publicise your energy efficiency achievements to staff, customers and shareholders?	☐	☐

Buildings, plant and equipment	**Yes**	**No**
Do you have energy efficiency standards for building construction, lighting and any central refrigeration equipment?	☐	☐
Do you use energy-efficient display cabinets?	☐	☐
Do your stores use lower lighting levels out of trading hours?	☐	☐
Have you considered using heat ejected from refrigeration systems to help to heat your stores?	☐	☐
Operation and maintenance		
Can you ensure that store lighting, ventilation and heating are on only when required?	☐	☐
Are cold-stores and refrigerated displays checked regularly for badly fitting seals and doors?	☐	☐

ENERGY MANAGEMENT – IMPLEMENTING AN ACTION PLAN

Implementing an action plan

Maintaining control over energy use and making improvements year by year requires planning and a programme of action. The action plan below follows a suggested route to success, from the first step of obtaining top-level commitment, through to the stage where energy efficiency is an ongoing feature of management culture.



ENERGY MANAGEMENT – IMPLEMENTING AN ACTION PLAN

Obtain top-level commitment

A successful energy management programme requires a specified person to be responsible for energy. Large groups may have a designated energy manager, but in smaller groups or single stores this position may be held by a senior manager or store manager.

1

Set up an information system

To control energy costs you will need a system for keeping records of the energy use and costs at individual stores. The system should allow you to compare energy use in stores from one period to another, and between stores. It should also allow you to assess the performance company-wide.
For further details see GPG 190.

2

Check fuel and electricity supply contracts and tariffs

- Big savings may be achieved by changing your supply tariffs or, if you are a large user, obtaining competitive quotations from the open contract market (restricted until 1998 to electricity supplies costing more than £20 000 a year and gas supplies costing more than £1000).
- Tariff and contract savings can make a valuable start to an energy management programme and generate savings which can be used for investment purposes.
- Food stores are in a good position to obtain tariff and contract savings because refrigeration provides a steady demand, which is popular with suppliers.
- Seek further cost savings by ensuring that power factor and maximum demand are appropriate for the tariffs used.
- Start by holding discussions with your existing suppliers. You can investigate options yourself or bring in specialists.

3

Inform and motivate staff

- Sensible use of buildings and intelligent operation of equipment by staff can save 5% to 10% of energy costs. Staff must be motivated to reduce usage and they should be aware of techniques to help them achieve savings (see GPG 190).
- Savings will be maintained only if there is a continuing programme of information, posters and other initiatives to keep up awareness.
- Area and store managers can be motivated by store performance comparisons.
- Staff may be motivated by drawing parallels to home energy costs and by the environmental aspects of energy saving.
- Evidence of commitment from senior management greatly helps to motivate at all levels.

4

Assess the performance of stores

- An index which relates energy use in a store to its floor area can identify poorly performing stores.
- Accepted yardstick figures for energy use and cost are provided in 'Introduction to energy efficiency in shops and stores' (EEB 3). These figures can also be used to assess the whole estate – should you be setting more ambitious energy-saving targets?

5

Implement programmes of energy-saving measures

- Some savings can be made at once through good housekeeping measures, at little or no expense.
- Other measures may require time, expertise or money – these should be investigated and planned more carefully.
- Have one or more representative stores surveyed by in-house staff or specialists – options for savings should be costed and their benefits and savings assessed. A fully costed programme with payback details can then be drawn up.

6

Review progress and revise plans

- An overview of energy efficiency achievements should be presented regularly at board level and included in the company annual report.
- Energy targets, investment plans and actions should be reviewed and updated annually.

7

TECHNICAL MEASURES – REFRIGERATION

REFRIGERANTS AND GLOBAL WARMING

The Montreal Protocol (1987) resulted in the banning of refrigerants using chlorofluorocarbons (CFCs), and the phasing out of some of the initial alternatives to CFCs in favour of refrigerants with zero ozone depletion potential (ODP).

Some low-ODP refrigerants are, in fact, less efficient than the refrigerants they replace. Different options can be compared by using the total equivalent warming impact (TEWI). This takes account of the direct global warming from refrigerant losses, and the indirect warming from emissions released by the power station generating electricity for the refrigeration plant.

Any supplier claiming that its products have a global warming benefit should be asked to justify this in terms of the TEWI as described in British Standard BS4434.

In many cases, the need to change refrigerant can be viewed as an opportunity to renew equipment. The resulting savings in operating cost can help pay for the replacement (as reported in Good Practice Case Study 230, 'A new refrigeration system in a small cold-store).

REFRIGERATION

Refrigeration can account for up to 50% of a food store's energy costs. Compressors are the main consumers of this energy and they should be sized to match the cooling load. Where wide variations in load can occur, variable speed drives should be able to match the compressor capacity to the load as closely as possible.

The main areas where savings in refrigeration costs can be made are:

- system design, layout and selection
- operation
- maintenance
- retrofit measures.

Design, selection and layout

The main issue to be addressed with refrigerated storage and display cabinets is the removal of heat from the refrigerator condensers. This waste heat can lead to overheating of the store and discomfort for staff and customers.

If cabinets can be grouped together, there is the potential either to remove heat from the units and recover it, or to discharge the heat directly to the outside. Alternatively, cooling can be provided from a central unit remote from the sales area, or via a split system. Both options provide the potential for recovering heat to provide space heating or hot water.

Open-fronted multi-deck refrigerated display cabinets are available which incorporate air paths and diffusers that virtually eliminate leakage of cooled air. Select cabinets with good levels of insulation and easy-to-fit night blinds. For displays where goods are moved less often, consider clear day covers or plastic strip curtains.

For cold-rooms, specify high standards of insulation with effective, easy-to-use door closures.

Operation

- Avoid over-filling shelves. Apart from the danger of spoilage, over-filling may mean that set temperatures have to be lowered in order to maintain all products in a safe condition.
- Watch for excessive ice build-up. This can be a sign of air leakage into and out of the unit, or inappropriate defrosting procedures.
- Ensure that insulating covers and blinds are used as intended. Leaving them off can increase energy use for both refrigeration and store heating.
- Ensure that lighting in cabinets is switched off outside trading hours, and that cold-store lights are used only when necessary. This saves electricity for lighting and also saves the electricity required for the refrigeration to remove the heat generated by the light.

The latest cabinet designs have light piped in, using fibre optics, to minimise lighting heat input.

Case studies

Night blinds installed on refrigerated display cabinets at the Waitrose store in Windsor repaid the initial cost in three years. The initial cost would have been halved if the blinds had been installed from new. (See Good Practice Case Study 223, 'Night blinds on refrigerated cabinets'.)

This energy efficiency poster used by Iceland Frozen Food encouraged good refrigeration practice, including preventing blocked grilles, checking curtain conditions and turning off open ends.

TECHNICAL MEASURES – REFRIGERATION

Maintenance

- Ensure that temperature settings are appropriate for health and safety requirements, but do not lower them further – this leads to overcooling and energy waste.
- Ensure that defrost procedures are followed – too infrequent and the machines lose efficiency due to ice build-up; too frequent and excessive energy is used for defrost. Make maximum use of cheap rate electricity – usually between midnight and 7.00 am.
- Clean condenser fins and keep air paths to condensers clear.
- Check door seals on cold rooms, fridges and frozen food stores. Poor seals lead to air leakage, higher energy use and potential product spoilage and ice build-up.

Retrofit measures

Consider upgrading insulation for cabinets and pipework, and door seals on fridges and cold rooms. The current level of insulation can be assessed by visual inspection and measurement. Thermal imaging can be used for more detailed surveys.

Further measures include:

- adding insulating night covers where not already fitted
- adding day covers to freezer cabinets and to refrigerated displays, if appropriate
- installing efficient compressors, electronic expansion valves and advanced control systems for central refrigeration
- installing energy-saving controls for individual items
- using reject heat for space heating or hot water.

Case studies

Energy savings of 20% were achieved by Doble Quality Foods (GPCS 230) with measures which included:

- efficient central compressors
- larger heat exchangers
- low-powered evaporator fans
- comprehensive performance monitoring.

Advanced control systems achieved savings for Safeway (General Information Report (GIR) 3). Integrated systems, ice storage and using reject heat for store heating or hot water are among many options.

Computerised control of central refrigeration plant by Plymouth and South Devon Co-operative Society achieves savings by avoiding unnecessary plant use.

Compressor controllers installed by Iceland Frozen Food have saved 11% of refrigeration costs and repaid initial costs within two years. Installed on freezer cabinets with integral compressors, the units can also work for chilled display cabinets (GPCS 27).

Tesco Brent Cross fish and meat counter

Chilled display cabinets at Iceland Frozen Food

JARGON BUSTER

Compressor – comprises an electric motor and refrigerant pump and is the heart of a refrigeration system. Located either locally (eg in a display cabinet) or centrally in a plant room.

Evaporator – the cold part of a fridge circuit; removes heat from a display cabinet.

Condenser – the warm part of a circuit; rejects heat to the atmosphere. Usually has a fan to aid heat loss, and may be combined with the compressor (a 'condensing unit').

Refrigerant – the fluid which is pumped round a system, evaporating to remove heat and then condensing to give off heat.

Ice storage – allows plant to run more at night when electricity is cheaper and when electricity generation is more efficient, producing lower levels of CO_2 emissions. In practice, system efficiency can be reduced and savings may be marginal – issues such as the available space for chillers or condenser plant can be decisive.

TECHNICAL MEASURES – LIGHTING

LIGHTING

LIGHTING MYTHS

These commonly held beliefs about lighting are NOT true.

- 'A fluorescent lamp uses so much energy when it is first switched on that you should not switch it off.'
- 'Fluorescent lighting is too cheap to worry about.'
- 'Switching lights off shortens their lives so much that they should be left on.'

Lighting accounts for about 20% of total energy costs in a food store. There are many opportunities for specifying more efficient lighting equipment, and for reducing the hours of use. Further information is provided in GPG 210, 'Energy efficient lighting in the retail sector'.

The main areas where savings in lighting costs can be made are:

- system design, layout and selection
- operation
- maintenance
- retrofit measures.

Design, selection and layout

Light levels should be appropriate to the area of the shop. Storage areas, offices and other non-public areas can be lit to different levels.

The warmer lighting required for foodstuffs should not be provided by tungsten lamps. Appropriate fluorescent lamps, with filters if necessary, should be specified. Special lamps with particular colour balances are available, but these can be inefficient. High-frequency, high-efficiency fluorescent tube fittings can save up to 20% compared with traditional fluorescent lighting and can be dimmable. Check that the light levels and power requirements of sales lighting are appropriate by referring to the box 'Is your sales area lighting efficient?' (left).

For car parks and other external areas, high-pressure sodium lamps are at least six times more efficient than tungsten lamps (see table opposite 'Relative energy consumption for similar light outputs').

Operation

Staff cooperation and possibly automatic controls will be needed if the amount of lighting used is to be reduced.

- A half to two-thirds of sales area lighting can be turned off out of trading hours.
- Lighting in staff areas, service areas and store rooms should be turned off when these areas are not occupied.
- During hours of darkness, external lights are needed only during trading and re-stocking times subject to safety and security requirements.

Is your sales area lighting efficient?

Calculate the total power (in watts) of lighting in a typical part of your sales floor, add 15% (only 8% if high-frequency lights) for control gear, and divide by the floor area covered by these lights. A result less than 15 W/m^2 is good for normal light levels (600-800 lux), while 20 W/m^2 is good for the high light levels in some stores (800-1000 lux).

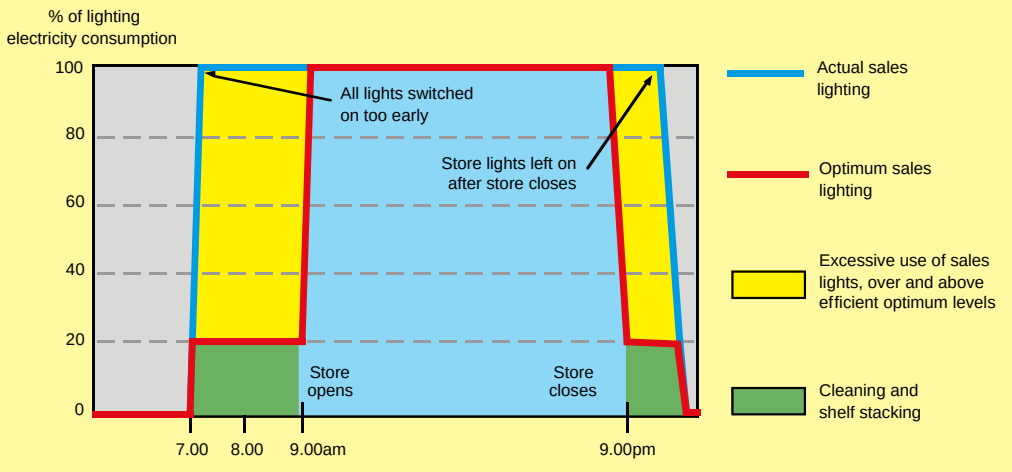


Figure 1 Remotely monitored energy use quickly shows up poor lighting control

TECHNICAL MEASURES – LIGHTING

A 'last person out' switch can be installed so that it is simple to turn off everything not needed at night. Similarly, a 'non-trading' switch can be installed to reduce lighting levels while the store is occupied outside trading hours.

Central automatic controls can be programmed to turn lights on and off to match trading times, though it is essential to retain local manual override.

Maintenance

Maintenance is essential to ensure the required level of luminance is provided. Failure to clean lamps and luminaires can result in increased energy consumption by raising lighting levels; it also leads to overheating and premature failure of lamps and associated equipment (see figure 2). GPG 210 provides more information on maintaining lighting systems.

Retrofit measures

Refurbishment and retrofit present an ideal opportunity for energy efficiency lighting measures to be incorporated into an existing retail outlet. In addition to improving light levels and saving energy, you can also alter the look of the store by the choice of luminaires. GPG 210 gives further advice on refurbishment.

Relative energy consumption for similar light outputs

	%
Tungsten filament bulb	100
Tungsten halogen spotlight	70
Compact fluorescent with electronic ballast	18
Induction or electrodeless lamp	18
Metal halide	15
High pressure sodium	11
Fluorescent tubes:	
38 mm (T12) choke and starter	18
26 mm (T8) choke and starter	16.5
26 mm (T8) electronic ballast	13
16 mm (T5) HF electronic ballast	<12

Department of the Environment, Transport and the Regions, EEB 3 'Introduction to energy efficiency in shops and stores', p9

Case study

High-efficiency sales area lighting saves the Plymouth and South Devon Co-operative Society £20 000 a year at its Transit Way store. A high level of illumination (1100 lux) is provided on the sales floor, but high-frequency, low-energy fluorescent lights in reflective fittings achieve this with a power consumption of 25 W/m^2 – less than many stores with much lower levels of lighting.

JARGON BUSTER

Lux – the SI unit of illuminance, or amount of light on a surface. The range for sales floors in food stores is typically 600 to 1000 lux.

Ballast/control gear – apparatus to start and control the current through fluorescent and other discharge lamps.

Efficacy – a measure of the effectiveness of a lighting installation in converting electrical power to light. The units are lumens/watt.

Luminaire – the correct term for a light fitting; it controls the light from a lamp and includes all components for fixing, protecting the lamps and connecting them to the electricity supply.

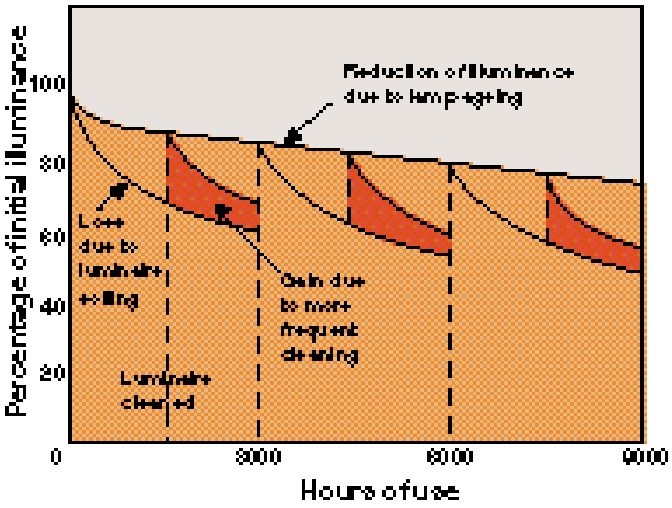


Figure 2 Cleaning luminaires will increase light output

TECHNICAL MEASURES – VENTILATION, HEATING AND COOLING

JARGON BUSTER

Combined heat and power (CHP) plant – generates electricity and at the same time provides useful heat for store heating and hot water.

Condensing boilers – provide efficiencies of up to 90%, mainly because heat is recovered from the flue gases by condensation. This process lowers the temperature of the flue gases to between 40°C and 80°C instead of over 250°C as in conventional boilers.

Variable speed drives – electronic devices that control the electrical supply to motors to match output more closely with demand.

VENTILATION, HEATING AND COOLING

Ventilation, heating and cooling can account for 25% of the energy costs in a food store. Electricity for fans alone can account for more than half the cost of ventilation, heating and cooling.

The main areas where savings in ventilation, heating and cooling costs can be made are:

- system design
- operation
- maintenance.

System design

Heating systems should use high-efficiency equipment and be designed for flexible control.

- Specify high-efficiency or condensing boilers.
- Isolate domestic hot water from space heating systems.
- Ensure that heating is not used in areas where it is not needed.
- Turn off heating systems in warmer weather.

A detailed analysis should indicate whether cooling is required throughout the store or only in specific areas. Although the capital and running costs of local systems are higher per unit floor area than for centralised systems, if the treated area is smaller they should be more economical.

Operation

Bakery ovens should be operated only when needed. They should not be turned on until required and should be shut down after use. Shutdown can be achieved in stages if less oven space is required towards the end of the day.

To recover heat from a central refrigeration system to heat the store, ventilation and heating plant must include appropriate heat exchangers. There must also be arrangements for rejecting refrigeration heat if the store does not need to be heated.

If refrigeration energy is to be used directly for heating, display cabinets must have integral compressors. These will give out heat to the aisles and so reduce heating energy requirements. It may also be possible to make use of spilt cold air from chiller cabinets to cool other areas of the store.

Case study

Sainsbury's Beckenham store has two-speed fans so the ventilation rate can be reduced at times of low occupancy (detected by an air quality sensor).

Ventilation and heating systems were designed to make use of waste heat from refrigeration. Heat from lighting and from the bakery is also re-used. The store uses high-efficiency gas boilers for top-up heating or hot water not provided from waste heat. Heat curtains to external doors are controlled to operate only during trading hours and when the outside temperature is below 15°C.

Automatic controls are available which measure air quality to indicate the number of people present and reduce the ventilation at times of low occupancy. Used with variable speed fans, such controls will reduce fan power, saving heating costs in winter and cooling costs (if any) in summer.

Door curtains should be used in loading bays to reduce heat loss.

Maintenance

Maintenance should be given prime consideration at the design stage since, if access is difficult, maintenance could be neglected. For example, allowance should be made for replacement of filters to ductwork and refrigeration units.

Retrofit measures

The main energy-saving opportunities are through:

- the use of improved controls to match supply volumes to actual requirements
- the use of efficient equipment such as variable speed fan and pump motor drives
- heat recovery from extracted air
- recirculation of room air.

Further information is provided in GPG 201, 'Energy efficient refurbishment of retail buildings'.

TECHNICAL MEASURES – OTHER ISSUES

AUTOMATIC CONTROLS

A building energy management system (BEMS) can be a powerful energy efficiency tool, but care is required in its planning and operation. It can provide:

- flexible control of building services, lighting and other systems, allowing the use of equipment only when needed.
- remote fault diagnosis, monitoring and operation via a telephone connection to a central console, allowing central staff to have more control over time schedules and settings, while allowing limited local control
- ease of use (with suitable design and training).

Case studies

J Sainsbury has developed a remote computerised monitoring and diagnosis system which automatically communicates energy anomalies to individual stores within 24 hours, ensuring that problems are rapidly resolved.

Waitrose has employed remote monitoring to tighten control of lighting, heating and refrigeration in more than 80 of its food stores. Savings of £600 000 were identified within six months from reduced energy use and protecting refrigerated stock.

WATER

Water supplies can be a major cost, and procedures should be developed to identify leaks and avoid wasteful practices. Staff motivation should encompass use of water. In addition, automatic controls can be installed to reduce consumption.

Case study

Water controls installed in Safeway stores have saved 200 000 m^3 of water, saving £250 000 in the first year of operation. Automatic urinal control units allow operation of the cistern only after a urinal has been used.

FURTHER INFORMATION

FURTHER INFORMATION

British Standards Institution

British Standard BS4434:1995. Specification for safety and environmental aspects in the design, construction and installation of refrigeration appliances and systems.
389 Chiswick High Road, London W4 4AL
Telephone 0181 996 9000.

Chartered Institution of Building Services Engineers (CIBSE)

Useful publications include:

- AM5 Energy Audits and Surveys
- AM6 Contract Energy Management
- The Standard Maintenance Specification for Mechanical Services in Buildings

Delta House, 222 Balham High Road, London SW12 9BS. Telephone 0181 675 5211

DETR ENERGY EFFICIENCY BEST PRACTICE PROGRAMME PUBLICATIONS

The following Best Practice programme documents are available from BRECSU Enquiries Bureau. Contact details are given below.

Good Practice Guides

186 Developing an effective energy policy
190 Energy efficiency action pack – for retail premises
200 A strategic approach to energy and environmental management
201 Energy efficient refurbishment of retail buildings
210 Energy efficient lighting in the retail sector

Good Practice Case Study

148 Energy management. J Sainsbury plc.

General Information Reports

12 Organisational aspects of energy management. Energy management guide.
13 Reviewing energy management

Energy Efficiency in Buildings

3 Introduction to energy efficiency in shops and stores

The following Best Practice programme publications are available from ETSU Enquiries Bureau. Contact details are given below.

Good Practice Guides

36 Commercial refrigeration plant: energy efficient operation and maintenance
37 Commercial refrigeration plant: energy efficient design
38 Commercial refrigeration plant: energy efficient installation
59 Energy efficient design and operation of refrigeration compressors
84 Managing and motivating staff to save energy
85 Energy management training

Good Practice Case Studies

27 Compressor motor controllers on refrigeration plant
182 Energy efficiency motivation campaign in a multi-site organisation
223 Night blinds on refrigerated cabinets
230 A new refrigeration system in a small cold store

General Information Report

36 Feasibilty and design study of continuously variable capacity refrigeration plant

OTHER ORGANISATIONS

Energy Systems Trade Association

This is a trade association of suppliers of services and equipment for improving energy efficiency – including energy consultants, ventilation and air-conditioning, lighting, and heat recovery.
PO Box 16, Stroud,
Gloucestershire GL6 9YB
Telephone 01453 886776

Energy Saving Trust

The Energy Saving Trust manages a range of schemes to provide financial support for energy efficiency measures, many applicable to retailing.
11-12 Buckingham Gate,
London SW1E 6LB
Telephone 0171 931 8401

The Department of the Environment, Transport and the Regions' Energy Efficiency Best Practice programme provides impartial, authoritative information on energy efficiency techniques and technologies in industry and buildings. This information is disseminated through publications, videos and software, together with seminars, workshops and other events. Publications within the Best Practice programme are shown opposite.

For further information on:

Buildings-related projects contact:
Enquiries Bureau
BRECSU
BRE
Garston, Watford, WD2 7JR
Tel 01923 664258
Fax 01923 664787
E-mail brecsuenq@bre.co.uk

Industrial projects contact:
Energy Efficiency Enquiries Bureau
ETSU
Harwell, Oxfordshire
OX11 0RA
Tel 01235 436747
Fax 01235 433066
E-mail etsuenq@aeat.co.uk

Internet **BRECSU** – http://www.bre.co.uk/brecsu
Internet **ETSU** – http://www.etsu.com/eebpp/home.htm

Energy Consumption Guides: compare energy use in specific processes, operations, plant and building types.

Good Practice: promotes proven energy efficient techniques through Guides and Case Studies.

New Practice: monitors first commercial applications of new energy efficiency measures.

Future Practice: reports on joint R&D ventures into new energy efficiency measures.

General Information: describes concepts and approaches yet to be fully established as good practice.

Fuel Efficiency Booklets: give detailed information on specific technologies and techniques.

Introduction to Energy Efficiency: helps new energy managers understand the use and costs of heating, lighting etc.